

## New and little known species of the genus *Spilomicrus* (Hymenoptera: Diapriidae) from the Eastern Palaearctic

## Новые и малоизвестные виды рода *Spilomicrus* (Hymenoptera: Diapriidae) из Восточной Палеарктики

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Three new species, *Spilomicrus pilosiventris* **sp. nov.** from the Far East of Russia, Japan, China, Taiwan and Nepal, *S. comatus* **sp. nov.** from Japan and the Far East of Russia and *S. sergeyi* **sp. nov.** from the Primorskiy Territory of Russia, are described and illustrated. *Spilomicrus kumaonensis* Sharma, 1980 is recorded for the first time for the fauna of the Far East of Russia, Japan, South Korea, Taiwan and Nepal.

Описаны и иллюстрированы три новых вида рода *Spilomicrus* Westwood, 1832: *S. pilosiventris* **sp. nov.** с Дальнего Востока России, Японии, Китая, Тайваня и Непала, *S. comatus* **sp. nov.** с Дальнего Востока России и Японии и *S. sergeyi* **sp. nov.** из Приморского Края России. *Spilomicrus kumaonensis* Sharma, 1980 впервые указан для фауны Дальнего Востока России, Японии, Южной Кореи, Тайваня и Непала.

**Key words:** Eastern Palaearctic, Oriental Region, taxonomy, key, Hymenoptera, Diapriidae, *Spilomicrus*, new species, new records

**Ключевые слова:** Восточная Палеарктика, Ориентальная область, таксономия, ключ, Hymenoptera, Diapriidae, *Spilomicrus*, новые виды, новые находки

## INTRODUCTION

*Spilomicrus* Westwood, 1832 is the nominal genus of the tribe Spilomicrini (Diapriidae). This genus comprises more than 170 valid species in the world fauna, 43 of which are recorded in the Palaearctic Region (Johnson, 1992; Hymenoptera Online, 2015). *Spilomicrus* species are usually small size parasitoids (1.0–4.5 mm) with mainly dark, smooth and shining body. The known hosts of this group are in different families of Diptera (Honda, 1969; Hoffmeister, 1989; Masner, 1991; Notton, 1999; Masner & García, 2002).

The genus *Spilomicrus* is a poorly known group of parasitic wasps with numerous undescribed species. Its European fauna was studied better than the fauna of other parts

of the Palaearctic Region (Tomsik, 1947). This study of the Eastern Palaearctic fauna allows discovering the significant species diversity and morphological variety in this genus. Three peculiar new species from the Russian Far East, Japan, Taiwan and Nepal are described in this paper and an extensive region for two related species, *Spilomicrus pilosiventris* **sp. nov.** and *S. kumaonensis* Sharma, 1980, are shown.

## MATERIALS AND METHODS

Material of this species (221 specimens) from the Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia; ZISP) and the Canadian National Collection of Insects (Ottawa, Canada; CNCI) was studied. The type specimens of *Spilo-*

*micrus kuamoennsis* were investigated from the National Museum of Natural History (Washington, USA; USNM). Type material of the new species is mainly deposited at the collection of ZISP, part of paratypes are kept in CNCI and the Natural History Museum (London, UK; BMNH). The morphological terminology and abbreviations used following Masner and García (2002), Yoder (2004), and the Hymenoptera Anatomy Ontology (Yoder et al., 2010); measurements follow to Yoder (2004). Additional morphological terms are used: anterior incision of mesopleuron – the notch is situated at the border between the pronotum and mesopleuron significantly higher than ventral margin of pronotum (Fig. 23), and the pleurostomal distance – the longest transverse line between pleurostomal carinas (Fig. 8).

*Spilomicrus* can be recognized in the East Palearctic fauna using the generic key by Kozlov (1995) and in the Oriental fauna using the generic key by Rajmohana (2006); for generic synonymy see Johnson (1992) and Notton (2014). All photographs were obtained using a Leica M165 stereomicroscope equipped with a Leica DFC450 camera. Image stacking was performed with Helicon Focus 5.0.

## TAXONOMIC PART

### Order HYMENOPTERA

### Family DIAPRIIDAE

### Subfamily DIAPRIINAE

### Tribe SPILOMICRINI

### Genus *Spilomicrus* Westwood, 1832

*Spilomicrus* Westwood, 1832: 129.

Type species: *Spilomicrus stigmatalis* Westwood, 1832.

### Reduced key to *Spilomicrus* species of the Eastern Palearctic fauna

1. Occipital flange crenulate (Figs 19, 21, 28, 29); all legs without trochantelli ..... 2
- Occipital flange smooth (Fig. 9); at least fore- and mid-femora with trochantelli ..... 3
2. Side of pronotum with row of foveae along posterior margin; epomia absent; mesopleuron pubescent, sculptured in distal part (Fig. 23); entire head densely pubescent (Figs 17–19, 21), tentorial pits very large; malar sulcus shallow (Fig. 17); anterior margin of T2 straight; in lateral view mesoscutum convex; female antenna slender (Figs 19, 22) ..... *S. comatus* sp. nov.
- Side of pronotum without row of foveae along posterior margin; epomia sharp and strongly projecting (Fig. 28); mesopleuron bare and smooth (Fig. 26); head not densely pubescent (Fig. 28); tentorial pits absent; malar sulcus deep (Fig. 25); anterior margin of T2 arcuate (Fig. 29); mesoscutum in lateral view flattened; female antenna robust (Figs 26, 28) ..... *S. sergeyi* sp. nov.
3. Base of T2 with deep lateral groove and dense pubescence (Fig. 16); basal and lateral S2 grooves distinct ..... 4
- Base of T2 smooth and bare; base of S2 smooth ..... other Palearctic species
4. Female antenna slender (Figs 2, 4), A7–A13 in dorsal view quadrate or elongate; anterior margin of anterior scutellar pits open, not surrounded anteriorly by edge (Fig. 6); posterior part of female S2 with small area of transverse sculpture (Fig. 3) ..... *S. pilosiventris* sp. nov.
- Female antenna robust (Fig. 14), A7–A13 in dorsal view transverse; anterior margin of anterior scutellar pits close, surrounded anteriorly by edge (Fig. 15); posterior part of female S2 smooth. .... *S. kumaonensis*

### *Spilomicrus pilosiventris* sp. nov. (Figs 1–7)

*Holotype. Female. Russia, Primorskiy Terr., vicinity of Spassk-Dal'niy, 19–23 Aug. 1987 (S. Belokobylskij) (ZISP).*

*Paratypes. Russia: Primorskiy Terr., vicinity of Spassk-Dal'niy, 12–27 July 1991, 5–7 Aug. 1993, 13 July 1999 and 14–19 Aug. 2001 (S. Belokobylskij), 4 females, 2 males (ZISP, BMNH); Ussuriysk Distr., 20 km SW from Krounovka, 4–5 Aug. 1993 (S. Belokobylskij), 1 female (ZISP); 30 km SE from Ussuriysk, 17–19 July 2001 (S. Belokobylskij), 1 female (ZISP); vicinity of Vladivostok, 27 July 1981 (V. Trjapitzin), 1 female (ZISP); Gornotaezhnoe, 43°66'N, 132°25'E, 4–18 Aug. and 5–7 Sept. 1999 (M. Michailovskaya), 7 females, 1 male (CNCI). Ja-*



**Figs 1–7.** *Spilomicrus pilosiventris* sp. nov. 1, face; 2, whole body; 3, metasoma, ventral view; 4, antenna of female, lateral view; 5, antenna of male: a, A1–A6 in dorsal view, b, whole antenna, lateral view; 6, 7, mesosoma in dorsal (6) and ventral view (7).

**pan:** Hokkaido, Sapporo, Hitsujigaoka, 21–27 July 1989 (M. Sharkey & K. Maeto), 1 male (CNCI); Honshu, Iwate Pref., Mt. Hayachine, 400 m, 20–27 June and 11–19 July 1989, June–July 1989 and 20 Aug. – 3 Sept. 1989 (H. Maki-hara & M. Sharkey), 1 female, 4 males (CNCI). **China:** N-Yunnan, Dali Bai Autonomous Pref., 1 km W from Dali, 25°41'N, 100°08'E, 2170 m, 1–3 Sept. 2003 (A. Smetana), 3 males (CNCI). **Taiwan:** Taiching Hsien, Suchilanchi, 1600 m, 24 Sept. 1997 (B. Sinclair), 2 males (CNCI); Ping-

tung Hsien, Peitawushan, 1500 m, 1 May 1992 (A. Smetana), 1 female (CNCI). **Nepal,** Kathmandu, Godavari, 6000 ft (=1830 m), 4–20 Aug. 1967, 13–17 Aug. 1976 (Canadian Expedition), 1 female, 3 males (CNCI).

**Comparative diagnosis.** *Spilomicrus pilosiventris* sp. nov. is very closely related to *S. kumaonensis* Sharma, 1980 from which differs by characters listed in the key (see couplet 4). The new species easily differs from all other Palearctic species by us-

ing the key above. *Spilomicrus pilosiventris* differs from similar Nearctic *S. masneri* Özdikmen, 2010 (Masner, 1991) by following characters: occipital flange without sculpture (sculptured in *S. masneri*); head in dorsal view strongly transverse (50 : 28) (less transverse [35 : 28] in *S. masneri*); notauli absent (notauli present but shallow in *S. masneri*); axes of anterior scutellar pits parallel (axes convergent anteriorly in *S. masneri*); posterior scutellar pits developed on scutellar disk only (developed on scutellar disk and laterally from it on lateral rim in *S. masneri*).

**Description.** Female. Body length 2.3 mm. Forewing length 2.4 mm. Antenna length 2.0 mm.

Body black; palpi yellow; tegulae, legs, venation, mandible and A2–A5 reddish brown; A7–A13 dark brown; A1 mainly reddish brown, its base dark.

Head in dorsal view transverse (50 : 28), slightly wider than mesosoma (50 : 45); in lateral view higher than long (45 : 28). Entire head with fine setigerous punctures and scattered long setae. Tentorial pit distinct. Malar sulcus complete and deep. Clypeus smooth and shining, subrectangular, narrower than height (10 : 11), weakly convex; clypeal flange broad and projecting forward (Fig. 1). Epistomal sulcus indistinct, distinct only in lateral view. Mandibles short, bidentate, lower tooth longer than upper. Eye bare, large, weakly shorter than half of head height (21 : 20), oval (20 : 15). Malar area/eye height 10 : 15. Ratio of pleurostomal distance to head width 17 : 50. Antennal shelf moderately projecting, smooth and bare between toruli. Ocelli not large; LOL slightly shorter than width of front ocellus; POL longer than OOL (9 : 5). Occipital flange narrow, without sculpture. Postgenal area with dense cushion of setae.

Antenna with slender and non-abrupt 7-segmented clava. A1 cylindrical, weakly arcuated, shine, covered with scattered long setae, with two projecting lamellae apically overlapping base of A2. A2 subquadrate in lateral view, in dorsal view truncated to

base. Connection between clavomeres in lateral view situated dorsally (Fig. 4). A13 without ventral pit, equal to A12. Ratios of length to width of antennal segments in dorsal view: 24 : 6; 7 : 5; 12 : 5; 11 : 5; 10.5 : 5; 9 : 5; 8 : 5.5; 7.5 : 6; 7 : 6; 7 : 6; 7 : 6; 12 : 6.

Mesosoma in lateral view longer than high (42 : 31), in dorsal view longer than wide (42 : 31). Neck bare, with irregular shallow grooves. Pronotal cushion dense; pronotal shoulders distinctly convex, rounded; lateral pronotal area smooth and bare. Propleuron smooth, with dense short pilosity. Mesopleuron smooth, with two longitudinal sulci under tegula, shining and bare at medial area. Sternaulus absent. Anterior incision of mesopleuron and setose pit on lower pronotum before it distinct. Ventral side of mesopleuron pubescent and smooth. Acetabular carina sharp, strongly projecting, in medial part moved anteriorly between fore coxa (Fig. 7). Postacetabular sulcus, mesodiscrimen and mesopleural epicoxal carina absent. Mesoscutum convex, transverse (29 : 20), shine, with few setigerous punctures and long setae along proximal margin. Notauli absent. Humeral sulcus developed as shallow pressure. Anterior scutellar pits large, not surrounded anteriorly by edge (Fig. 6); its axes parallel. Axilla and scutellar disk smooth, with few setae. Axillar depression pubescent and smooth. Lateral scutellar pit small. Posterior scutellar pits small, distinct and deep. Metascutellum with median and lateral keels; between keels and at lateral side developed row of regular deep punctuation. Propodeum coarsely rugose, covered with pale pubescence, distinctly transverse and weakly truncate posteriorly. Median propodeal keel distinctly projecting anteriorly and directed upwards. Posterior margin of propodeum without notch at lateral and dorsal sides. All legs with trochantelli; fore- and mid-legs slender, hind-femora weakly thickened.

Fore wing clear. Marginal vein slightly elongate (8 : 7), stigmal vein equal to length of marginal vein. Costa not tubular, weakly



pigmented. Submarginal and basal veins tubular and pigmented; 1CU shot. Ratio of largest width to length of fore wing 16 : 40.

Petiole cylindrical, in dorsal view longer than its median width (12 : 10), with regular and very deep longitudinal grooves. Petiole with dense setae ventrally, hirsute belt developed at lateral and dorsal sides medially. Base of T2 with deep lateral and basal grooves and dense pale long setae (Fig. 16). Posterior part of T2 smooth; surface of T3–T6 with dense setigerous punctures and numerous long white setae. T5 expanded laterally and covered with numerous setae and punctures at sides. Surface of T6 and T7 situated perpendicularly to preseding tergites. Basal and lateral S2 grooves present; setae at base abundant but not dense, posterior part of S2 with scattered long setae and with spot of rugose sculpture at posterior margin (Fig. 3). S3–S5 narrow, with micropunctures medially; S6 with numerous dense long erect setae and dense deep punctures.

**Variation.** Body length 2.0–2.3 mm. A1–A6 dark brown to red. A7–A12 subquadrate to transverse. Notauli visible as trace or absent; humeral sulcus distinct to shallow. Median propodeal keel lower to distinctly higher than level of scutellum. Two lateral keel of metascutellum distinct to absent. Sculpture of T3–T5 coarse to fine.

**Male.** Body length 1.2–2.5 mm. Similar to female, but differs mainly in antennal and metasomal structures. A3–A13 dark brown to reddish brown, covered by short dense pale setae; A2 reddish brown, smooth, with long sparse setae. A4 weakly excavated; keel developed from base of segment and reaching to half of its length or longer. Ratios of length to width of antennal segments in dorsal view: 24 : 7; 6 : 6; 13 : 5.5; 15 : 5.5; 14 : 5.5; 14 : 5; 13 : 5; 12 : 5; 11 : 5; 11 : 5; 11 : 5; 10.5 : 4.5; 16 : 4. Proportions of segments very variable. T5 not expanded laterally. Apical sternite without dense long setae.

**Distribution.** Russia (Primorskiy Terr.), Japan (Hokkaido, Honshu), China (Yunnan Province), Taiwan, Nepal.

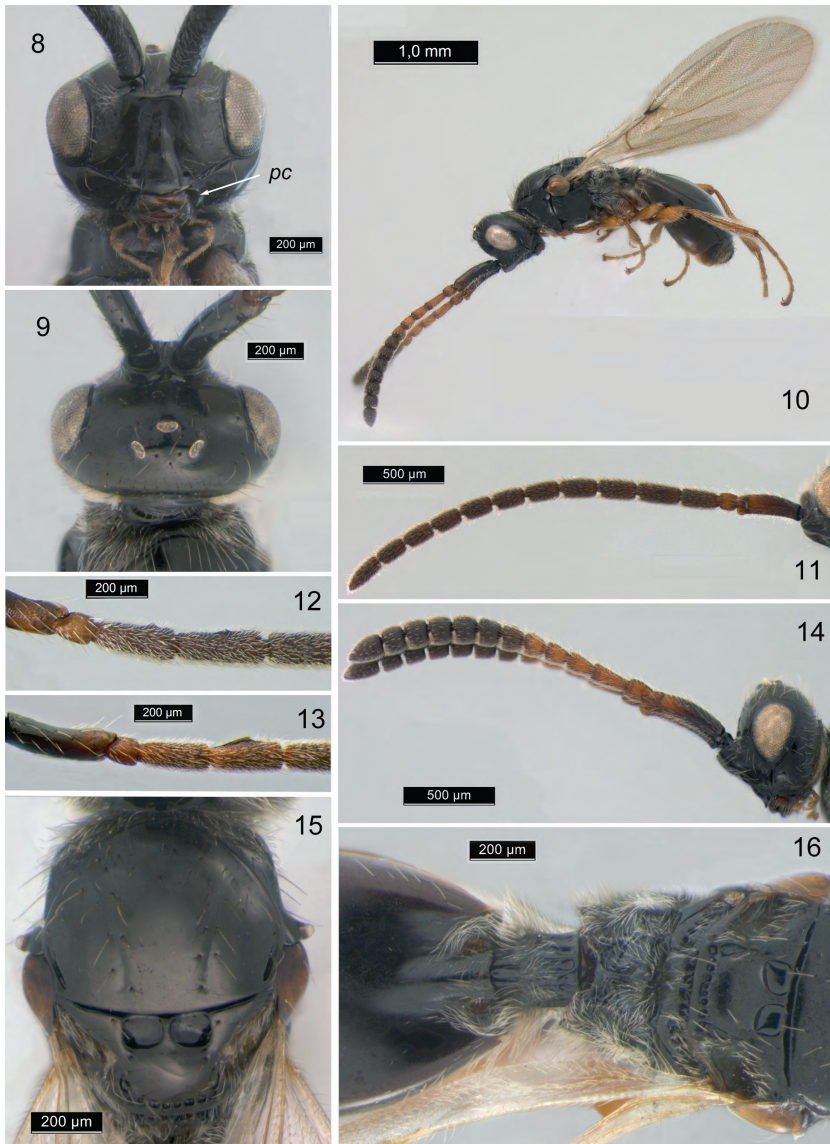
**Etymology.** Derived from Latin *pilosus* (pilose) and *venter* (abdomen).

***Spilomicrus kumaonensis* Sharma, 1980**  
(Figs 8–16)

*Spilomicrus kumaonensis* Sharma, 1980: 58; Mani & Sharma, 1982: 238, 239; Johnson, 1992: 216; Rajmohana, 2006: 68.

**Type material.** **India**, Ramgarh, 26 km from Naini Tal (Kumaon Survey), 18–24 July 1974 (M.S. Mani & party), holotype female (USNM).

**Other material.** **Russia:** *Khabarovsk Terr.*, Udyal Lake, 29–30 Aug. 1970 (D. Kasparyan), 1 female. *Sakhalin Prov.*, Kunashir I., Tretyakovo, 3–10 Aug. 1973 (D. Kasparyan), 1 male. *Primorskiy Terr.*: vicinity of Spassk-Dal'niy, 25–27 July 1991, 5–7 Aug. 1993, 9 July – 2 Aug. 1995 and 14–19 Aug. 2001 (S. Belokobylskij), 5 females, 2 males; Anisimovka, 3 Sept. 1988 (S. Belokobylskij), 1 male; 24 km E from Spassk-Dal'niy, Novovladimirovka, 12 July 1991 (S. Belokobylskij), 1 male; Dalnegorskiy Distr., 2–8 Sept. 1982 (S. Sinev), 1 male; Lazo Natural Reserve, July 2007 (K. Makarov), 1 female; same locality, 25–26 Aug. 2006 (S. Belokobylskij), 1 female; Kamenushka, 25–27 July 2010 (E. Tselikh & D. Rachin), 1 female; Ussuriysk Distr., 26–30 July 1972 (M. Kozlov), 1 male; Gornotaezhnoe, 43°66'N, 132°25'E, 4–10 Aug. 1999 (M. Michailovskaya), 1 female; same locality, 31 July – 5 Aug. 1991 (S. Belokobylskij), 1 female; 10 km NW from Artem, 30 July 2001 (S. Belokobylskij), 1 female; Kedrovaya Pad Natural Reserve, 14 Aug. 1982 (S. Belokobylskij), 1 female. **Japan:** *Hokkaido*, 40 km S from Sapporo, 4 Sept. 1999 (S. Belokobylskij), 3 females; Sapporo, Jozeanai, 350 m, 1–10 and 21–29 Aug. 1989, Aug. 1989 (K. Maeto & M. Sharkey), 5 males; Sapporo, 28 Aug. – 1 Sept. 1989 (M. Sharkey & K. Maeto), 2 males; same locality, 24–29 July and 25 June – 2 July 1988 (K. Maeto), 2 males; same locality, 1 Aug. 1989 (M. Sharkey), 1 male; *Honshu*, Aichi, Shitara, Uradani, 900 m, 13 June – 24 July and 19–25 Sept. 1994 (K. Yamagishi), 8 females, 4 males; Iwate Pref., Mt. Hayachine, 400 m, 27 June – 26 July 1989 (H. Makihara & M. Sharkey), 1 female, 2 males; Gumma Pref., Matusuida, Kirizumi Spa, 1100 m, 2 Sept. 1996 (L. Masner), 1 female; Tochigi Pref., 1000 m, Ohnuma Lake, 10 Aug. 1989 (M. Sharkey), 1 female. **South Korea**, *Chungbuk*, Yeongdong-gun, Sangchonmyon, 4 Aug. – 24 Sept. 2002 (P. Tripotin), 1 male.



**Figs 8–16.** *Spilomicrus kumaonensis* Sharma. **8**, face; **9**, head, dorsal view; **10**, whole body; **11–13**, antenna of male in lateral view (**11**), A1–A5 in dorsal view (**12**, **13**); **14**, antenna of female, lateral view; **15**, mesosoma, dorsal view; **16**, mesosoma and anterior part of metasoma, dorsal view. *pc* – pleurostomal carina.

**Taiwan:** Wugeng, 16–22 March 1983 (H. & M. Townes), 1 female, 9 males; Wushe, 1150 m, 13 Apr. 1983 (H. Townes), 1 male; Taiching, Hsien, Anmashan, 2225–2230 m, 30 Apr. – 4 May 1990 (A. Smetana), 2 males; Nantou Hsien, E. Shankan, 2000–2200 m, 28 May 1990 (J. Heraty), 1 male. **Nepal:** *Kathmandu*, Godavari, 6000 ft (=1830 m), 7–26 Aug. 1967 (Canadian Expe-

dition), 2 females, 1 male; Phulcoki, 2600 m, 13 Oct. 1983 (A. Smetana), 1 male.

**Variation.** Body length 1.9–3.1 mm. Metasoma and propodeum dark brown to black. Female A7 dark brown to red, subquadrate to transverse; A2–A6 yellow to reddish brown; entire A1 dark or its distal part brown to reddish brown. Male A3 with

short keel (Fig. 12) or without keel (Fig. 13); A4 keel short, developed medially and not reaching of segment base (Fig. 12) or distinctly developed from segment base and reaching of its half (Fig. 13). Clypeus weakly (7 : 6) to distinctly (7 : 5) transverse. Trace *in situ* notauli visible or mesonotum flattened; humeral sulcus distinct to shallow. Median propodeal keel lower to distinct over than scutellum. Lateral keel of metascutellum visible to indistinct. Posterior scutellar pits distinct and large to small and fused. Sculpture of T3–T5 distinct to fine.

**Distribution.** Russia (Khabarovsk and Primorskiy Terr., Kunashir I.), South Korea, Japan (Hokkaido, Honshu), Taiwan, Nepal, Northern India (division of Uttarakhand, Kumaun).

***Spilomicrus comatus* sp. nov.**  
(Figs 17–24)

**Holotype.** Russia, Primorskiy Terr., vicinity of Anisimovka, 4 Sept. 1982 (V. Tobias) (ZISP).

**Paratypes.** Russia: Primorskiy Terr., vicinity of Spassk-Dal'niy, 4–7 Aug. 1987 (S. Belokobyl'skiy), 3 males (ZISP); same locality, 10 July 1990 (S. Belokobyl'skiy), 1 female, 2 males (ZISP, CNCI); same locality, 10–27 July 1991 (S. Belokobyl'skiy), 5 females, 13 males (ZISP, CNCI); same locality, 12 July 1993 (S. Belokobyl'skiy), 1 female (ZISP); same locality, 9–10 July 1995 (S. Belokobyl'skiy), 3 males (ZISP); same locality, 13 July 1999 (S. Belokobyl'skiy), 2 males (ZISP); same locality, 14 Aug.–6 Sept. 2001 (S. Belokobyl'skiy), 7 females, 3 males (ZISP, CNCI, BMNH); Lazo Nature Reserve, 25–26 Aug. 2006 (S. Belokobyl'skiy), 10 females, 9 males (ZISP); vicinity of Chernigovka, 20 July 1991 (S. Belokobyl'skiy), 1 female, 1 male; vicinity of Anisimovka, 4 Sept. 1982 (V. Tobias), 1 female (ZISP); same locality, 3 Sept. 1988 (S. Belokobyl'skiy), 2 females, 1 male (ZISP); same locality, 10 Aug. 1991 (S. Belokobyl'skiy), 2 males (ZISP); same locality, 29 Aug. 2001 (S. Belokobyl'skiy), 3 females, 2 males (BMNH, ZISP); vicinity of Vladivostok, 30 July 2001 (S. Belokobyl'skiy), 1 female, 3 males (ZISP); Gornotaezhnoe, 43°66'N, 132°25'E, 4–18 Aug. and 5–7 Sept. 1999 (M. Michailovskaya), 4 females (CNCI); same locality, 31 July–5 Aug. 1991 (S. Belokobyl'skiy), 1 male (ZISP); Merkushevka, 21 July 1991 (S. Belokobyl'skiy), 3

males (ZISP); vicinity of Ussuriysk, 17–19 July 2001 (S. Belokobyl'skiy), 1 male (ZISP). **Japan:** Hokkaido, Bibai, Kushunai, 200–250 m, 3 July 1989 (M. Sharkey), 1 female (CNCI); Okinawa, Hiji Waterfall, 11 May 1999 (B. Sinclair), 1 male; Okinawa Yona, Rhukyu Univ. Res. Station, May 1999 (B. Sinclair), 1 female.

**Comparative diagnosis.** *Spilomicrus comatus* sp. nov. differs from others Palaearctic and Oriental *Spilomicrus* species by following characters: head entirely with numerous equable setigerous punctuation and long setae (Figs 17, 19, 21); occipital flange narrow and with distinct deep sculpture (Figs 19, 21); pronotum laterally with row of foveae along posterior margin (Fig. 23); mesopleuron laterally with numerous horizontal grooves and covered with dense pale setae (Fig. 23).

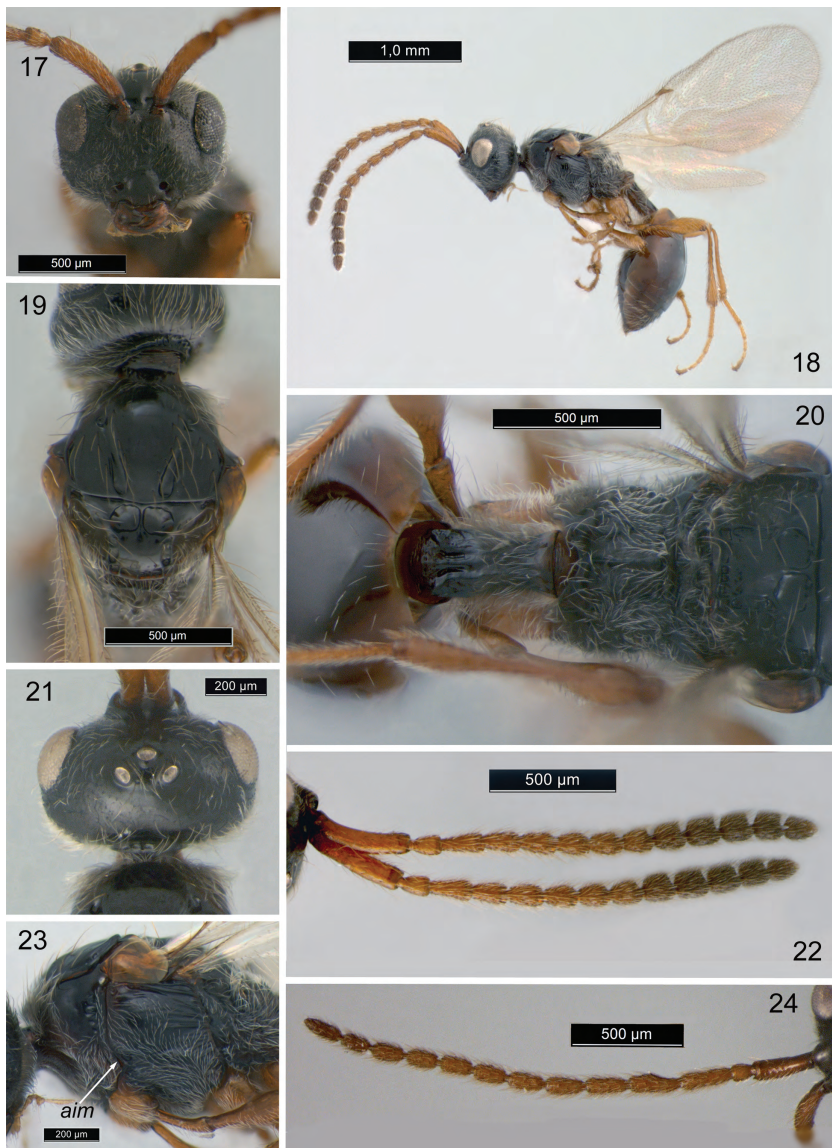
**Description.** Female. Body length 3.0 mm. Fore wing length 3.0 mm. Antenna length 2.0 mm.

Body mainly black; tegulae, legs, venation, mandible and A1–A8 reddish brown; A9–A13 dark brown; palpi yellow.

Head in dorsal view distinctly transverse with weakly prominent antennal shelf (30 : 22) and wider than mesosoma (30 : 27), in lateral view higher than long (30 : 22). Head entirely covered by numerous fine and equable setigerous punctuation with moderately long setae. Tentorial pits large. Malar sulcus complete, narrow. Clypeus bare, small, semicircular, as high as wide, convex. Mandibles projecting forwards and strongly overlapping, bidentate, upper tooth shorter than lower tooth. Eye oval (13 : 10), with few short setae; ratio of half of head height to height of eye 15 : 13. Malar space shorter than eye height (10 : 13). Ratio of pleurostomal distance to width of head 11 : 30. Ocelli: LOL shorter than width of anterior ocellus (5 : 6); POL shorter than OOL (7 : 15). Occipital flange narrow, with distinct sculpture. Postgena with long setae forming dense cushion.

Antenna slender with non-abrupt 5-segmented clava. A1 cylindrical, curved, slightly broadened apically, with fine coriaceous sculpture and long setae. Apical rim simple.





**Figs 17–24.** *Spilomicrus comatus* sp. nov. 17, face; 18, whole body; 19, 23, mesosoma in dorsal (19) and lateral view (23); 20, mesosoma and anterior part of metasoma, dorsal view; 21, head, dorsal view; 22, 24, antenna of female (22) and male (24). aim – anterior incision of mesopleuron.

A2 rounded, in lateral and dorsal view truncate to base. Ventral side of A9–A13 weakly flattened, with well-developed MGS brush. A8–A13 separated by deep gaps. In lateral view connection between A8–A13 situated dorsally (Figs 18, 22). A13 without ventral pit. Ratios of length to width of antennal segments in dorsal view: 20 : 4; 6 : 4; 9 : 4; 7 :

4; 7 : 4; 6.5 : 4; 6.5 : 4; 6.5 : 4.5; 6.5 : 5; 6 : 5; 6 : 5; 6 : 5; 7 : 4.

Mesosoma in lateral view longer than high (20 : 13); in dorsal view longer than wide (4 : 3). Neck bare, with deep and short longitudinal grooves. Pronotum with cushion of pale setae. Pronotal shoulders prominent, rounded. Side of pronotum with row



of foveae and setae along posterior margin. Propleuron covered by dense pubescence. Mesopleuron with numerous horizontal grooves and covered by pale setae. Sternaulus absent. Anterior incision of mesopleuron distinct, with numerous setae before and around it; pit on pronotum before this incision absent. Acetabular carina sharp, strongly prominent and moved posteriorly in medial part; postacetabular sulcus present. Area between acetabular carina and front coxa pubescent. Mesodiscrimen shallow. Mesopleural epicoxal carina developed only laterally. Mesoscutum transverse (28 : 20). Notauli complete, broad, well impressed. Humeral sulcus distinct. Mesoscutum, axilla and scutellum with few scattered long setae, smooth and shine. Scutellum flattened, with two large circular anterior scutellar pits. Axillar depression smooth and pubescent. Lateral scutellar pits long and broad. Posterior scutellar pit large and deep (Figs 19, 20). Metascutellum pubescent, coarse rugose; median and lateral keels weakly projecting. Propodeum coarse rugose, with pale pilosity and several longitudinal irregular keels, narrowed posteriorly. Median propodeal keel projecting anteriorly and directed upwards. Posterior margin of propodeum in dorsal view weakly arcuate. All legs slender, without trochantelli.

Fore wing clear. Marginal vein elongate (8 : 3); stigmal vein longer than width of marginal vein (9 : 8). Submarginal veins tubular. Costa and basal vein nebulous. Ratio of width to length of fore wing 15 : 37.

Metasoma. Petiole cylindrical, elongate, twice as long as wide, with deep longitudinal grooves, entirely pubescent excluding its distal third of dorsal side. T2 with micro punctures near posterior margin. T3–T5 with dense fine punctuation and one row of long setae; setae denser laterally. T5 covered with numerous pale decumbent setae at side. T6–T7 very small. S2 smooth, with weak cushion at base; other surface with numerous scattered long setae. S3–S5 with dense punctuation and one row of long se-

tae. S6 with coarse and dense punctuation and with short setae apically.

**Variation.** Body length 2.2–3.3 mm. Head equal to wider than mesosoma width. A3 equal to distinctly longer than A2. A9–A13 dark brown to yellowish brown. A10–A11 subquadrate to weakly elongate. Petiole equal to 0.20–0.38 of mesosoma length. Pubescence of S2 cover all surface of segment or its medial part only.

**Male.** Body length 1.6–3.1 mm. Similar to female, but differs in some characters: eyes larger, ratio of its height to half of head height 17 : 16; A3–A13 dark brown, with short dense pale pubescence; A1–A2 reddish brown, smooth, with long sparse setae; A4 weakly excavated, with straight keel developed from its base and reaching 0.8 to 0.9 of its length; ratios of length to width of antennal segments in dorsal view: 20 : 4.5; 5 : 4; 15 : 4; 15 : 5; 10.5 : 4.5; 11 : 4.5; 12 : 4.5; 12 : 4.5; 12 : 4.5; 12 : 4.5; 11 : 4; 11 : 4; 14 : 3, but sometimes proximal segments of flagellum much more shortened; A3 equal to A4 or longer; petiole more elongate (21 : 7), equal to 0.30–0.33 of mesosoma length.

**Distribution.** Russia (Primorskiy Terr.), Japan (Hokkaido, Okinawa).

**Etymology.** Derived from Latin *comatus* (having long hair).

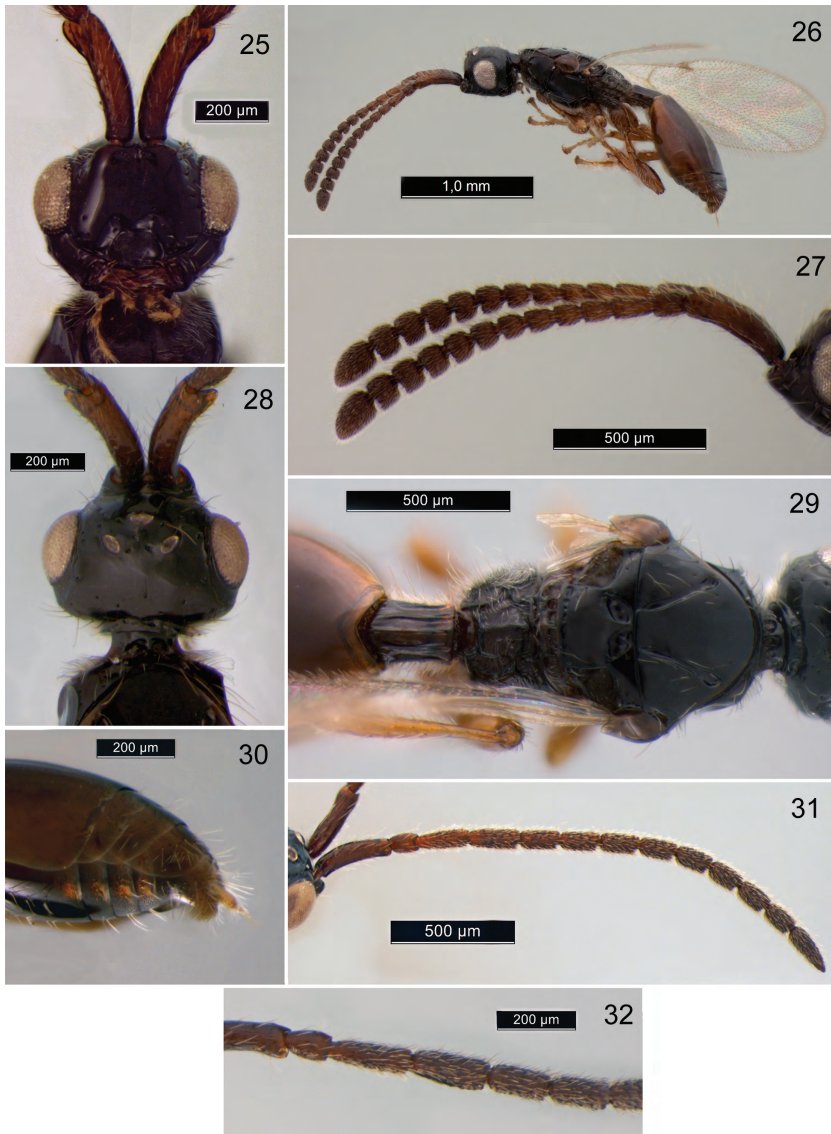
### *Spilomicrus sergeyi* sp. nov.

(Figs 25–32)

**Holotype.** *Female.* **Russia**, *Primorskiy Terr.*, vicinity of Spassk-Dal'niy, 4–10 Sept. 2001 (S. Belokobyl'skij) (ZISP).

**Paratypes.** **Russia:** *Primorskiy Terr.*, vicinity of Spassk-Dal'niy, 25–27 July 1991 (S. Belokobyl'skij), 1 female, 8 males (ZISP, CNCI); 30 km E from Spassk-Dal'niy, 25 July 1991 (S. Belokobyl'skij), 4 females, 4 males (ZISP, CNCI, BMNH); vicinity of Spassk-Dal'niy, Evseevka, 17–18 July 1991 (S. Belokobyl'skij), 1 female, 10 males (ZISP, BMNH); vicinity of Spassk-Dal'niy, Novovladimirovka, 12 July 1991 (S. Belokobyl'skij), 1 female (ZISP).

**Comparative diagnosis.** The species easy differs from other Palaearctic species by following characters: clypeus separated from



**Figs 25–32.** *Spilomicrus sergeyi* sp. nov. 25, face; 26, whole body; 27, antenna of female, lateral view; 28, head, dorsal view; 29, mesosoma and anterior part of metasoma, dorsal view; 30, female, posterior part of metasoma, lateral view; 31, antenna of male, lateral view; 32, male A1–A8 in dorsal view.

clypeal flange with sharp inflection; epistomal sulcus deep; occipital flange moderately broadened with irregular sculpture; acetabular carina moved anteriorly between fore coxa; median propodeal keel low, not elevated anteriorly; anterior margin of T2 arcuate; S6 with numerous dense long erect setae. *Spilomicrus sergeyi* sp. nov. is closely re-

lated to *Nigropria compressa* Rajmohana & Narendran, 2000, but differs from it in having moderately compressed body (strongly compressed in *N. compressa*), strong projecting antennal shelf (weakly projecting in *N. compressa*), clypeus large and convex, epistomal sulcus deep (clypeus small and flattened, epistomal sulcus shallow in *N. com-*

*pressa*), head in lateral view subglabrous (subrectangular in *N. compressa*), with weak elevated convexity behind eyes (with distinct ridge behind eyes in *N. compressa*).

**Description.** Female. Body length 2.2 mm. Fore wing length 1.8 mm. Antenna length 1.5 mm.

Body mainly black; tegulae, mandibles and antennae dark brown; metasoma reddish brown; legs, venation and palpi yellowish brown.

Head in dorsal view transverse (21 : 18), weakly narrower than mesosoma (20 : 21) with strongly projecting antennal shelf; in lateral view as high as long. Head covered with scattered long setae. Tentorial pits large. Malar sulcus complete and deep. Clypeus smooth, semicircular, broader than high (8 : 6), finely convex, separated from clypeal flange by sharp inflection. Epistomal sulcus distinct and deep. Mandibles long, weakly overlapping, bidentate, with equal teeth. Eye large: higher than half of head height (15 : 13), oval (15 : 12), surrounded by weak elevated convexity. Malar area distinctly shorter than eye height (6 : 15). Pleurostomal distance equal to half of head width. Ocelli: LOL equal to width of front ocellus; POL weakly longer than OOL (7 : 6). Occipital flange broad, with irregular sculpture (Figs 28–29). Postgenal area with weak cushion of setae.

Antenna with non-abrupt 5-segmented clava. A1 cylindrical, distinct curved, slightly broadened apically and covered by fine irregular sculpture and scattered long setae. Apex of A1 apically with two projecting lamellae overlapping base of A2. A2 rectangular in lateral view, in dorsal view truncated to base. A9–A13 flattened on ventral side, with distinct MGS brush. Connection between A8–A13 in lateral view situated dorsally. A8–A13 separated by deep gaps. A13 with ventral pit. Ratios of length to width of antennal segments in dorsal view: 28 : 6.5; 10 : 6; 11 : 5; 7 : 5; 7 : 5; 8 : 5; 7 : 5.5; 7 : 6; 7 : 6.5; 7 : 7; 7 : 7.5; 7 : 7.5; 13 : 7.5.

Mesosoma depressed, in lateral view longer than high (50 : 25), in dorsal view

longer than wide (50 : 35). Neck bare, with longitudinal grooves. Pronotum at median part perpendicular to mesoscutum, poorly setose; pronotal shoulders convex, sharp, forming epomia; lateral pronotal area smooth, with few setae along posterior margin only. Propleuron smooth, with dense short pilosity. Mesopleuron smooth, shining and bare, with two longitudinal sulci under tegula. Sternaulus complete, developed as sharp keel. Anterior incision of mesopleuron distinct; pit on pronotum before it present, finely setose. Ventral side of mesopleuron pubescent. Acetabular carina sharp, strongly prominent and moved anteriorly in medial part between fore coxa, not interrupted medially. Postacetabular sulcus absent. Mesodiscrimen shallow. Mesopleural epicoxal carina developed only laterally. Mesoscutum flattened, wider than long (19 : 14), with few scattered long setae. Notauli complete throughout and well impressed, converging posteriorly. Humeral sulcus absent. Anterior scutellar pits oval (Fig. 29). Axilla and scutellar disk smooth, with few setae only. Axillar depression pubescent and smooth. Lateral scutellar pits absent. Posterior scutellar pits fused together and forming narrow groove. Metascutellum and propodeum coarsely rugose, with numerous erect setae. Median and lateral keels of metascutellum weakly projecting. Propodeum distinctly transverse (14 : 7), truncate posteriorly; median propodeal keel low, not elevated anteriorly. Posterior margin of propodeum weakly arcuate. All legs robust, shortened, without trochantelli.

Fore wing clear. Marginal vein elongate (5 : 4). Stigmal vein equal to width of marginal vein. Submarginal vein tubular. Costa, basal and cubital veins pigmented but not tubular. Ratio of width to length of fore wing 3 : 8.

Metasoma. Petiole cylindrical, in dorsal view longer than median width (17 : 11), with regular longitudinal grooves, with short and long setae on ventral and laterals sides. Metasoma past petiole broad and de-



pressed. Anterior margin of T2 arcuate (Fig. 29). Posterior part of T2 and surface of T3–T6 with microsculpture and short scattered setae. T5 expanded laterally and covered by numerous setae at sides. T7 punctured with numerous long erect setae. S2 with cushion of setae at base, posterior part of S2 with scattered long setae, smooth. S3–S6 covered with micropunctures; S3–S5 narrow; S6 with dense long erect setae (Fig. 30).

**Variation.** Body length 1.6–2.5 mm. Metasoma except petiole and antenna reddish brown to dark brown. A7 subquadrate to elongate. Convexity surrounded eyes flattened to distinct. Septum between anterior scutellar pits sharp to broad. Posterior scutellar pits fused or separate. Median and lateral keels of metascutellum visible to indistinct.

**Male.** Body length 1.9–2.5 mm. Similar to female, but differs mainly in antennal structures and metasomal proportions. Antennae dark brown to reddish brown; A3–A13 covered with short dense pale setae; A1–A2 smooth, with long sparse setae. A4 weakly excavated with straight keel developed from base and reaching 0.60–0.75 of segment length. Ratios of length to width of antennal segments in dorsal view: 15 : 4.5; 5 : 4; 10 : 3.5; 10 : 5; 8 : 4; 8 : 4; 7.5 : 4; 7 : 4; 7 : 4; 7 : 4; 6 : 4; 11 : 4. Petiole elongate (15 : 7), equal to 0.32–0.34 of mesosomal length. T5 not expanded laterally and without supplementary setae at sides. Apical sternite without dense long setae.

**Comments.** The species was compared above with the Oriental *Nigropria compressa* Rajmohana & Narendran, 2000, the type species of the monotypic genus *Nigropria* Rajmohana & Narendran, 2000.

**Distribution.** Russia (Primorskiy Terr.).

**Etymology.** Named in honor of the Russian hymenopterist and expert on Bracnidae Dr Sergey A. Belokobylskij who collected all specimens of this new species.

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